

1. (Amended) A *Borrelia burgdorferi* epitope polypeptide with an amino acid sequence selected from the group consisting of: VQEGVQQEGAQQP-(beta-A)(beta-A)C; EIAAKAIGKKIHQNNG-(beta-A)(beta-A)C; ISTLIKQKLDGLKNE-(beta-A)(beta-A)C; PWAESPKKPE-(beta-A)(beta-A)C; DKKAINLDKAQQKLD-(beta-A)(beta-A)C; ITKGKSQKSLDG-(beta-A)(beta-A)C; and GMTFRAQEGAFLTG-(beta-A)(beta-A)C.

2. (Amended) The composition of matter of claim 1, wherein said epitope polypeptide comprises VQEGVQQEGAQQP-(beta-A)(beta-A)C.

3. (Amended) The composition of matter of claim 1, wherein said epitope polypeptide consists essentially of VQEGVQQEGAQQP-(beta-A)(beta-A)C.

16. (Amended) A vaccine for immunizing against or treating for Lyme disease, the vaccine comprising an epitope polypeptide with an amino acid sequence selected from the group consisting of: VQEGVQQEGAQQP-(beta-A)(beta-A)C; EIAAKAIGKKIHQNNG-(beta-A)(beta-A)C; ISTLIKQKLDGLKNE-(beta-A)(beta-A)C; PWAESPKKPE-(beta-A)(beta-A)C; DKKAINLDKAQQKLD-(beta-A)(beta-A)C; ITKGKSQKSLDG-(beta-A)(beta-A)C; and GMTFRAQEGAFLTG-(beta-A)(beta-A)C.

17. (Amended) The vaccine of claim 16, wherein said epitope polypeptide comprises VQEGVQQEGAQQP-(beta-A)(beta-A)C.

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18. (Amended) The vaccine of claim 16, wherein said epitope polypeptide consists essentially of VQEGVQQEGAQQP-(beta-A)(beta-A)C.

31. (Amended) The nucleic acid sequence coding for a *Borrelia burgdorferi* epitope polypeptide with an amino acid sequence selected from the group consisting of VQEGVQQEGAQQP-(beta-A)(beta-A)C; EIAAKAIGKKIHQNNG-(beta-A)(beta-A)C; ISTLIKQKLDGLKNE-(beta-A)(beta-A)C; PWAESPKKPE-(beta-A)(beta-A)C; DKKAINLDKAQQKLD-(beta-A)(beta-A)C; ITKGKSQKSLDG-(beta-A)(beta-A)C; and GMTFRAQEGAFLTG-(beta-A)(beta-A)C.

32. (Amended) The composition of matter of claim 31, wherein said epitope polypeptide comprises VQEGVQQEGAQQP-(beta-A)(beta-A)C.

33. (Amended) The composition of matter of claim 31, wherein said epitope polypeptide consists essentially of VQEGVQQEGAQQP-(beta-A)(beta-A)C.